

January 5, 1993

Michael J. Schumacher
Mineral Development Engineer
Akzo Salt, Inc.
P.O. Box 352
Clarks Summit, Pennsylvania 18411-0352

Dear Mr. Schumacher:

The U.S. Environmental Protection Agency (EPA) has reviewed Akzo's proposal to inject up to 30,000 gallons of No. 2 fuel oil through Well # 58 at the Watkins Glen, New York facility. I understand that the fuel oil is to be placed in the annulus between the 7" and 9-5/8" casings in order to force the injection water to dissolve the lowermost salt layer. As the cavern develops, the oil will form a blanket on top of the brine, preventing dissolution of the top of the cavern and forcing dissolution and expansion of the cavern in the horizontal plane.

In order for EPA to properly evaluate Akzo's proposal, the following issues must be addressed:

- EPA has no map showing the location of Well # 58 in the brine field. Please submit a map indicating the distance from Well # 58 to the surrounding brine wells, to Seneca Lake and to streams that discharge into Seneca Lake.
- Provisions must be made for measuring any possible subsidence that might occur beneath Well # 58. This could be accomplished by including the well in Akzo's existing subsidence monitoring plan.
- Akzo must submit a plan detailing the steps that have been, or will be, taken to prevent fuel oil from contaminating ground water or Seneca Lake in the event of equipment failure or human error. In addition, Akzo must describe how such operating errors that result in the release of fuel oil would be detected in the first place.
- Although this office is responsible for protecting current and potential underground sources of drinking water, we would not feel comfortable allowing an injection activity that, while not likely to endanger ground water, might lead to the contamination of a food product. I understand that Akzo uses fuel oil at other facilities and has used fuel oil

in the past at Watkins Glen, presumably without producing contaminated salt. Please address these questions: Will the brine in contact with the fuel oil blanket ever be removed from the cavern? What degree of mixing is anticipated between the fuel oil and the brine? Is it expected that, under normal circumstances, some fuel oil may be produced with the brine, or would this occur only as the result of some equipment failure or worker error? How will Akzo ensure that the salt produced is free of any hydrocarbon contamination?

- Akzo's proposal calls for an average cavern radius of 100 feet and an average oil blanket thickness of 1.5 inches. It is my understanding that an oil pad does not lose its effectiveness until its average thickness has been reduced to about .25 inch and that an oil pad 1.5 inches thick would continue to promote horizontal expansion of the cavern. It appears, then, that injection of 30,000 gallons of oil would result in an average cavern radius significantly greater than 100 feet. How does Akzo reconcile the disparity between the volume of oil proposed and the intended radius of the cavern? How will Akzo control the growth of the cavern to minimize the potential for subsidence?
- The well penetrates three salt beds; Akzo plans to mine the lowermost layer first and work upward. Will an oil pad be used in mining each salt bed such that after each salt layer has been mined, the resulting brine-filled cavern will have a blanket of oil at its top? At some point during the life of Well # 58, it seems likely that there will be some collapse of the two rock layers that separate the three salt beds. As each rock layer collapses into the brine-filled cavern beneath it, any oil at the top of the cavern will be mixed in with the brine. Tubing damage may also occur, possibly allowing further mixing of oil and brine. Would this mixing, above and beyond what would normally be expected, make the ultimate separation of the oil and brine more difficult?

Please address the above issues. If you have any questions, feel free to call me at (212) 264-6897.

Sincerely,

Dermott Courtney
Underground Injection Control Section

cc: Peter Briggs, NYSDEC

bcc: F. Brock